

David H. Miller at the Milwaukee campus of the University of Wisconsin, recently began a 1-year appointment, under the National Oceanic and Atmospheric Administration's senior academician program at the National Climate Program Office. His duties will include an assessment of climate applications and the development of plans and programs to improve the effectiveness of the National Climate Program. ☐

[illegible][illegible][illegible][illegible]

The Oceanography Report



SITTING DESKTOP

The Oceanography Report

The focal point for physical, chemical, geological, and biological oceanographers.

Associate Editor: Arnold L. Gordon, Lamont-Doherty Geological Observatory, Palisades, New York, 10964 (telephone 914 359-2900, ext. 3251)

Graduate Enrollment in Oceanography

Charles D. Hollister and John G. Slater

Excellent job opportunities exist for well-trained Ph.D. graduates in marine geology, geophysics, chemistry, dynamical-physical oceanography, and oceanographic engineering.

This was one conclusion the deans of various schools of oceanography reached at a conference that included deans from Dalhousie University, Florida State University, the University of Hawaii, the University of Miami, Oregon State University, the University of Rhode Island, Scripps Institution of Oceanography, Texas A & M University, the University of Washington, and the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography. The results of this effort, combined with some of our own notions, form the basis of this short report. We hope that these thoughts will serve as a discussion base for more in-depth reflections.

The information supplied by each institution revealed that in the years just prior to the meeting in 1980 there had been too few qualified applicants in the fields of physical oceanography, geologic-geophysical oceanography, and ocean engineering to fill available vacancies. Each institution reported that over 50% of its total applicants were in biological oceanography. The supply of chemical oceanography applicants appeared matched to demand. Mathematics was generally found to be the principal weakness in many of the applications regardless of discipline.

On the demand side, there were found to be too few Ph.D.'s for the job market in all fields of oceanography except biological oceanography, although most well-trained (cross discipline) biologists had little trouble in this regard. Other statistics that emerged included (1) acceptance rate for offers of admissions averaged 50%, (2) average time to Ph.D. from B.S. degrees was about 6 years, and (3) drop out rates generally averaged about 25%.

Graduates who have the strongest background in the basic sciences were considered more attractive by recruiters, and those students who investigate a problem as it traverses disciplines seem to do better in the job market than those that confine their interests to the bounds of a single discipline.

The time, effort, and expense of recruiting certainly seem worthwhile, for institutions that did creative recruiting acquired a higher percentage of the candidates they had sought. Recent preapplication recruiting has substantially increased the number of good applicants to a given school. Success was also reported when active research scientists recruited in schools not already affiliated with oceanographic programs and in departments such as physics, math, chemistry, and engineering.

One recent proposal to AGU to do broad-scale, nationwide recruiting and lecturing about career opportunities in oceanography, in a nonschool specific fashion, has been declined. Thus it appears that each school will have to mount its own effort. Paid advertisements in school newspapers and journals widely read by undergraduates may be one way of initiating such an effort.

The prevailing Washington, D.C., mood, as reflected in the recent skirmish over NSF Graduate Fellowships, suggests that support for these fellowships will probably come under renewed attack next spring. It was concluded that graduate student support will be increasingly hard to find anywhere.

If present economic trends in this administration continue, we will have to rely even more heavily on the supply side of the economy to support the training process of our new scientists. Cross-sectoral linkages between industry and academia must be forged as soon as possible if industry expects to continue to reap the harvest of well-trained oceanographers that it has enjoyed up to now.

Charles D. Hollister is the Dean of Graduate Studies, Woods Hole Oceanographic Institution, Woods Hole, Mass. John G. Slater is the Director of the Joint Program, Massachusetts Institute of Technology, Cambridge, Mass.

Opinion

Scientific Freedom and the Sea

As one of the small band of professional marine scientists who have actually been delegates to the UN Law of the Sea Conference and who have been actively involved in negotiating some of the texts, I was most interested to read David Ross' article on marine scientific research. (*Eos*, 62, Sept. 1, p. 652). I was particularly glad to see that he urged a constructive attitude toward what many scientists seem to feel is a totally unjustified attempt to curb their 'freedom.'

Two aspects of the negotiations were particularly important in this regard. First, it was found impossible to differentiate satisfactorily between academic, economic, or military research. Much marine research (for instance that concerning gravity or water column temperature) is equally valuable to all three. Much apparently 'scientific' research is carried out by academic personnel using commercial sub-contractors and supported by military funds. This kind of confusion were large gravity, magnetic, and bathymetric surveys carried out by the U.S. Navy and NATO over the continental shelves of many Atlantic and Mediterranean coastal states (without notification or consent) during the 1960's, presumably under the justification that they were primarily military in purpose and therefore not covered under the existing 1958 agreement.

The resentment and mistrust that was created among the smaller coastal states by this and similar kinds of action was the dominant atmosphere under which the early framework of the marine scientific regulations was laid down. Representing one of the smaller coastal states myself, I became aware of many other examples of abuse that had occurred in the name of scientific freedom by universities and agencies who believed that they were working for the greater good. The harvest of regulations which we now face is undoubtedly one which we ourselves planted. In my opinion, too many scientists forgot that what feels like freedom from the deck of a ship looks much more like arrogance when viewed from the shore.

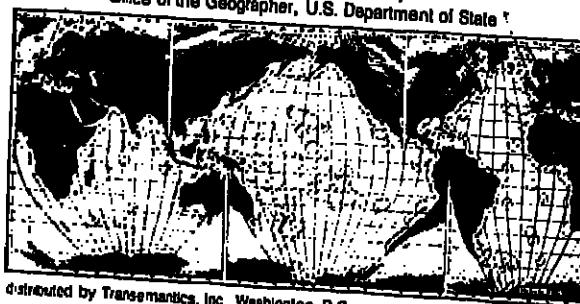
Robln P. Riddihough
Pacific Geoscience Centre
Sidney, B.C., Canada

Pondering Projections

The accompanying figure is an original 'World Map of Oceans and Seas,' plotted on one of a series of new equal-area projections (McBryde S3B2). Shown on the map are the areas of the 200-nautical-mile exclusive economic zone (EEZ), in true size relationship to one another. An equal-area map for such use is preferable to the Mercator conformal projection employed by the U.S. Department of State for its original map, which has been frequently reused, as in the September 1, 1981, 'The Oceanography Report' (David A. Ross, 'Marine Science and the Law of the Sea,' *Eos*, 62, p. 650). This is a common misuse of the invaluable Mercator Navigation Chart. Merely citing its high-latitude exaggerations cannot begin to rectify the enormous scale and size expansions and is no substitute for graphic comparability.

WORLD OCEANS AND SEAS 200-NAUTICAL-MILE ECONOMIC CLAIM ZONES (SHADED)

Source: Global Effect of 200 Nautical Mile Zone Claims
(on Mercator Projection)
Office of the Geographer, U.S. Department of State



distributed by Transmaritime, Inc., Washington, D.C.
McBryde S3 Equal-Area Sectional Projection in Oceanic Zones
Designed, drawn and 1977 by F. Webster McBryde
Approximate equatorial scale 1:510,000,000

The S3B2 projection map presents the entire earth/surface features in mathematically true areal proportions, yet with minimized distortions of shape and scale, in oceanic sections, each having an independent mid-meridian. This projection is composed of two other juxtaposed equal-area world projections: (1) the Mercator equal-area projection, with no scale error along parallels and mid-meridians, and (2) the McBryde-Thomas Flat-Polar Sinusoidal (derived from the first) for high latitudes, where extensions of polar lines one third the length of the equator reduce meridional compression east-west. This improves areal shapes and provides more polar plotting space. Straight horizontal parallels afford all-important latitudinal comparability. Such a map is recommended for plotting all areal data (e.g., the EEZ, oceanic depth zones, distribution of biomass of phytoplankton, ranges of botanical and zoological species and formations, sea ice, tectonic plates and trenches, continental shelf, slope and rise, mineral deposits, surface climatological data, and the like). For directional and angular plottings, as of winds, ocean currents, and

tides, the conformal Mercator is best. (Note: These new equal-area projections, though patented, will be made available at no charge, upon request, for any noncommercial, scientific use.)

F. Webster McBryde
Director,
McBryde Center for Human Ecology

Information Report

COSOD Opts for Explorer

With the withdrawal of industry support in the Ocean Margin Drilling Program (OMDP) (*Eos*, October 20, p. 705), a giant wave of uncertainty on the future of scientific ocean drilling swept over the oceanographic community. To steer the next decade's programs toward scientific objectives, the Conference on Scientific Ocean Drilling (COSOD) was held November 16-18 in Austin, Tex. The conference (scheduled before the industry decision) was sponsored by the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), one of the principal operating arms of the Joint Oceanographic Institutions, Inc. (JOI).

A broad range of global scientific objectives were identified that require a worldwide drilling program for at least the next decade. Roger L. Larson, chairman of the COSOD Steering Committee, told *Eos* at the meeting's conclusion. 'Many of these objectives can be accomplished with the presently available drill ship *Glomar Explorer*, but the extended capabilities of the *Glomar Explorer* are required to accomplish a large number of other objectives. Thus, it was the unanimous consensus of the conference attendees that *Glomar Explorer* was clearly the preferable vessel for future scientific ocean drilling.'

This conclusion was one of the four basic options for OMDP that could have been reached: terminate ocean drilling in 1983 (the end of the current phase of the *Glomar Challenger*'s drilling); continue drilling with *Challenger* for another 5 years; substitute the *Glomar Explorer* for the *Challenger* to extend nonriser drilling; and use the *Explorer* with full riser capabilities.

Larson added that the conference participants 'recognized that the availability of *Glomar Explorer* was subject to a yet-to-be-conducted cost analysis and that the drilling system would almost certainly be operated without a riser and blowout prevention system for at least several years. It was also recognized,' he continued, 'that future ocean drilling must be part of a larger scientific program that includes adequate support for planning, site surveying, geophysical experimentation, and sample analysis.'

This decision on the relative benefits of the two drill ships is the first of four steps enroute to deciding the future of scientific ocean drilling. Allen M. Shinn, Jr., director of the National Science Foundation's Office of Scientific Ocean Drilling, told the conference participants. The other steps are an assessment of the capital investments required to refurbish the *Challenger* versus those to convert the *Explorer*; 'accurate data on the comparative long-run operating costs of the two ships'; and an assessment of the 'level of commitment of our current and prospective IPOD [International Phase of Ocean Drilling] partners.'

Larson explained that COSOD succeeded to reamalgamate the IPOD drilling alliance. The conference was attended by 150 earth scientists representing the United States, the United Kingdom, France, the Federal Republic of Germany, Japan, the Soviet Union, Norway, Canada, Australia, and The Netherlands.

COSOD also included workshop discussions of the origin and evolution of oceanic crust; the origin and evolution of marine sedimentary sequences; the tectonic evolution of continental margins and oceanic crust; the causes of long-term changes in the atmosphere, oceans, cryosphere, biosphere, and magnetic field; and the tools, techniques, and associated studies. Presentations from JOIDES panels rounded out the meeting's agenda. On the basis of these workshops, about a dozen scientific priorities were outlined. The COSOD Steering Committee was drafting its report on these priorities at *Eos*' deadline.

Once the scientific objectives for OMDP are finalized, part of the task of ensuring that the objectives are met would presumably fall to JOI, a consortium of 10 academic oceanographic institutions. Formed in 1976, JOI describes its duties as bringing 'the collective capability of individual institutions to bear on large oceanographic research projects.' The National Science Foundation contracts with JOI to plan and carry out OMDP's scientific activities.

So that each member institution has a voice in the OMDP science program, JOI established a Scientific Advisory Committee (SAC), according to William W. Hay, JOI president, and Thomas A. Davies, JOI chief scientist. To aid in its planning, SAC appointed five regional planning advisory committees and is in the process of forming five technical panels, which will be concerned with geophysical publications, logging and downhole measurements, sample curation and data management, and laboratory facilities. The primary objective for OMDP for the next few months will be to develop the science program, Hay and Davies emphasized.

In addition to its OMDP responsibilities, JOI is charged with providing scientific advice and guidance for the Deep Sea Drilling Project, under the aegis of JOIDES, and with carrying out the regional synthesis program, which involves the consolidation of geological and geophysical data collected during the last 20-30 years in 11 geographic regions targeted by SAC as candidate drilling sites. Hay and Davies explained. The data include bathymetric, gravimetric,

and magnetic information, depths as recorded by seismic reflectors, and descriptions of lithofacies.

The regional synthesis program involves approximately two dozen institutions. Nothing on this scale has ever been done, Hay said. 'It will provide a solid basis for OMDP.' The actual data synthesis is almost complete. Publication of the information, including maps, will be in approximately 2 years, Hay estimated.—BTR

News and Announcements

Travel Grants Program

The Ocean Sciences Board (OSB) of the National Research Council is sponsoring a travel grants program for U.S. scientists who are participating in the Third Joint Oceanographic Assembly (JOA), slated for August 2-13, 1982, at Dalhousie University in Halifax, Nova Scotia.

U.S. scientists, including U.S. citizens and foreign nationals holding permanent visas, who need funds to participate in JOA may apply. Scientists employed by a federal agency will not be considered. Travel grants will be based on round-trip excursion air fares plus registration fees. Participants will be expected to find other funds for accommodations and living expenses.

Applications will be evaluated by an ad hoc OSB panel. The panel's criteria for selection are scientific merit of the contribution, importance of the contribution to the success of the assembly, age (younger scientists will receive special consideration), and uniqueness of the contribution or its value for international research planning.

Applications should be sent to OSB, National Research Council, 2101 Constitution Ave., N.W., Washington, D.C. 20418. Applicants should provide the following information in no more than two pages: name; professional address; phone number; birth date; principal sponsor(s) of research; title of paper, poster session, or other contribution (if an invited paper, specify session name and number and name of invitor); abstract of paper or poster; and any other information that will help in the evaluation. Applications must be received before January 1. Applicants will be notified on or about March 15.

Salt Disposal Effects Found Small

Brine discharges into the Gulf of Mexico averaging more than 600,000 barrels per day for the past year have had 'few significant effects' on the marine environment off the Texas coast, according to a preliminary analysis by scientists and engineers at the Texas A&M University. The brine, 8 times saltier than the surrounding seawater, is produced when salt from underground deposits on shore is dissolved and pumped into the Gulf as part of the Strategic Petroleum Reserve Program.

New Publications

Thunderstorms

C. Magono, *Develop. Atmos. Sci.*, Elsevier, New York, x + 261 pp., 1980

Reviewed by Peter V. Hobbs

In the preface to this book, *Thunderstorms*, the author points out that a researcher in atmospheric electricity would be hard pressed to provide a simple, succinct answer to the question, 'Why does electricity form in clouds?' Certainly, after some 200 years of research, the subject is still notorious for its prolificacy of theories and shortage of facts. Magono concludes, rather gloomily, that future research is likely to lead to even longer and more complex answers to this question. A disturbing prospect to anyone who believes that obfuscation generally conceals ignorance.

However, the present book is designed to clarify rather than obscure. It provides a straightforward review of observational studies and theories on charge generation in clouds, lightning discharges, and methods of protection against lightning. The treatment is largely nonmathematical and should be readily comprehensible to the nonspecialist familiar with classical physics. There are only a few indications that the author's first language is not English; he generously ascribes this to the help of friends. Would that more scientists whose first language is English could write so well in a foreign language, even with help.

The book begins with a short potpourri of subjects, including the dynamics of thunderstorms, their microphysical and electrical structures, and the distribution of charges in thunderstorms. The section on dynamics could have been strengthened if a clear distinction had been drawn between the various types of thunderstorms (almass, multicell, supercell, etc.). The American reader may be appalled to find no mention of Franklin in the discussion of the electrical structure of thunderstorms. But the history of the subject receives scant treatment throughout the book, a pity, since the author is in an excellent position to compare early western contributions with less well-known studies carried out in the Orient.

The heart of the book is contained in chapters 2-4 ('Precipitation Electricity,' 'Charge Generation in Thunderstorms,' and 'Non-Precipitating Thunderstorms and the Feedback Processes of Electric Fields and Precipitation'). These chapters provide detailed and up-to-date reviews of current understanding in these subjects. Most of the main theories for the electrification of cloud and precipitation particles and thunderstorms are described, although the author stealthily avoids committing himself to any one theory.

Lead by Roy Hann, Jr., of the Texas Engineering Experiment Station, the team is analyzing discharge from Bryan Mound at Freeport, Tex., and from the West Hackberry site near Cameron, La. After a year of discharge off Freeport, the researchers found 'no brine-caused differences in sediment temperatures and bottom-water dissolved-oxygen levels which accompany increased salinity,' Hann said. In addition, overall compositions of fish and shrimp remained stable.

'We are beginning to see a demonstrable, but not significant, environmental effect as a result of higher salinity,' Hann said. 'A few fish may be avoiding the discharge area, but we are seeing no deaths or other harmful effects.' There were some effects on the density of plankton in the area, but Hann said these differences were not large when compared to normally high month-to-month fluctuations in the plankton population.

The group also found that after more than a year of discharge, records of salinity in the region 'were consistent with the overall physical oceanography of the area.' Nevertheless, most scientists involved agree that more analysis is needed before a final evaluation can be made.

Meetings

CMOS Meeting

The Canadian Meteorological and Oceanographic Society will hold its Sixteenth Annual Congress and Annual General Meeting at the University of Ottawa, Ottawa, Canada, on May 28-29, 1982. The theme of the meeting will be Sea Ice. In addition to invited and contributed papers relating to the general theme, sessions will be held on other aspects of meteorology and oceanography depending on contributions. Poster sessions may be held, depending on response.

Titles and definitive abstracts (less than 300 words) should reach the program committee by February 1. Send material to George Isaac, Cloud Physics Research Division, Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario M3H 5T4 (telephone: 416-667-4683). Please indicate whether the paper is suitable for presentation in a poster session.

Tours are planned, and commercial exhibits will be on display. Organizations interested in obtaining display space should contact Brian O'Donnell, Atmospheric Environment Service, Ottawa, Ontario K1A 0H3 (telephone: 819-997-3511).

Oceans 82: Call for Papers

The Oceans 82 Conference and Exhibition will be held in Washington, D.C., on September 20-22, 1982. The confer-

ence's theme is 'Government, Industry, and Academia—Partners in Ocean Progress.'

A call for papers has been issued by the meeting's sponsors: The Marine Technology Society and the Institute of Electrical and Electronics Engineers Council on Oceanic Engineering. Requested are papers that highlight technological potentials and problems where successful realization could make significant contributions and that propose methods to foster ocean development. Among the 40 topics expected to be discussed are geology and geophysics, marine geodesy, ocean margin drilling, oceanographic ships, remote sensing from satellites and aircraft, seismic measurements, and water quality and pollution. Workshops, panel discussions, and an extensive exhibit of marine products and services also are planned.

For additional information and abstract forms, write to Oceans 82 Technical Program Chairman, Suite 412, 1730 M Street, N.W., Washington, D.C. 20036. The deadline for abstracts is February 14.

MARINE SCIENCE University of Miami

The University of Miami is searching for a Dean who will serve as the Director of its oceanographic and atmospheric institution which has 86 full-time faculty, 162 graduate and 305 undergraduate students, and a \$14 million budget. The main function of this position is to provide leadership to a thriving, multidisciplinary community of oceanographic researchers and students, including biological, chemical, physical and geological oceanographers, ocean engineers, atmospheric scientists and specialists in marine affairs. The person who directs this institution will be expected to promote its aims and provide liaison with federal agencies as well as private foundations, and to encourage new programs to meet the needs of both developed and developing nations, especially those of the Caribbean and South America.

Applications, including a current professional resume, nominations and further information should be sent to Dr. Norman G. Einspruch, Chairman of the RSMAS Dean Search Committee, University of Miami, School of Engineering and Architecture, P.O. Box 248261, Coral Gables, Florida 33124. Nominations and applications desired by December 15, 1981. Position will remain open until filled.

An equal opportunity affirmative action employer.

Coastal Upwelling

Francis A. Richards, editor

Coastal Upwelling, the first volume in AGU's newest book series, explores, studies, and reports on a vital part of our ecosystem through a multidisciplinary perspective.

Substantial progress has been made in identifying causal relations between physical and biological fields and processes. This progress aids in setting up consistent physical and biological data sets and models of the coastal upwelling system.

Topics include the environmental forcing functions and the physical, chemical, and biological aspects of the upwelling ecosystem.

Papers are, in part, derived from the IDOE International Symposium on Coastal Upwelling. Articles are also based on the expedition results of the Coastal Upwelling Ecosystems Analysis Program and similar research groups.

• 544 pages • Illustrated • Price \$23.00

American Geophysical Union
2000 Florida Ave., N.W.
Washington, D.C. 20009

Call 800-424-2468 toll free
462-6903 in the Washington, D.C. area

Orders under \$50 must be prepaid,
20% member discount



Standing orders are welcome.

AGU CHAPMAN CONFERENCE

DISCONTINUITIES IN ROCK

May 3-6, 1982 Sante Fe, New Mexico
Convenors: Lawrence Telford and Robert Flecker

Sessions planned:
Mechanics of formation and characteristics
Constitutive laws and deformational processes
Geophysical phenomena
Hydraulic properties
Mechanical and hydraulic modeling

First announcement published in *Eos*, September 8.
Deadline for application is December 15.

Classified

EOS offers classified space for Positions Available, Courses, and Announcements. There are no discounts or commissions on classified ads. Any type of fee is not publisher's choice is charged for an advertisement. EOS is published weekly on Tuesday. Ads must be received in writing on Monday 1 week prior to the date of the issue required.

Replies to ads with box numbers should be addressed to Box # American Geophysical Union, 2000 Florida Avenue, N.W., Washington, D.C. 20002

POSITIONS WANTED

Rates per line
1-5 times—\$1.00, 6-11 times—\$0.75,
12-26 times—\$0.55

POSITIONS AVAILABLE

Rates per line
1-5 times—\$2.00, 6-11 times—\$1.60,
12-26 times—\$1.40

SERVICES, SUPPLIES, COURSES, AND ANNOUNCEMENTS

Rates per line
1-5 times—\$2.50, 6-11 times—\$1.95,
12-26 times—\$1.75

STUDENT OPPORTUNITIES

For special rates, query Robin Little,
800-424-2488

POSITIONS AVAILABLE

University of North Dakota. Applications are invited for two tenure-track appointments in the Department of Geology, beginning January 1982.

- (1) petroleum geology or related fields
- (2) one of the following areas:
low-temperature geochemistry
carbonate petrology
economic geology

The first position will include teaching 1 or 2 courses per year in petroleum geology. Both positions require teaching undergraduate and graduate courses in the area(s) of expertise, directing graduate student research at the MS and PhD levels, and developing an active research program.

The Department has one full-time faculty, two adjunct faculty, about 150 undergraduates and 50 graduate students. Association with the North Dakota Geological Survey includes access to complete subsurface records, cores and samples for 9,000 wells in the Williston Basin. Proximity to the Williston Basin and Canadian Shield provides abundant opportunity for research in sedimentary, igneous, and metamorphic petrology, and economic geology. Excellent physical facilities, the state core and sample library, and excellent photo, map, and book collections are available.

The Ph.D. is required, salary and rank are open and competitive. Applications will be accepted until suitable candidates are found. Applicants should submit complete resumes, including education, previous experience, teaching and research interests, and at least three letters of reference to Dr. Richard D. Lefever, Chairman, Search Committee, Department of Geology, University of North Dakota, Grand Forks, ND 58202.

South Dakota School of Mines and Technology. Applications are invited for two positions in the Department of Geological Engineering. Both involve teaching at undergraduate and graduate levels, thesis direction and development of research.

Geological Engineering specialty in rock or soil mechanics, site evaluation, geophysics, petroleum reservoir engineering or engineering seismology. Industrial design experience preferred. A Ph.D. in some area of engineering is helpful. One Deposit area specialization is open. The successful applicant will work closely with the newly established Institute for the Study of Mineral Deposits. The Ph.D. is required.

The Department has an undergraduate enrollment of 170 majors and a graduate enrollment of 60. Field applications of geology and engineering are emphasized. Interested persons should send a resume and three letters of recommendation to: A. L. Lisenbee, Dept. of Geological Engineering, South Dakota School of Mines and Technology, Rapid City, SD 57701.

SDSMT is an equal opportunity employer.

Resource or Mineral Economics. The Department of Engineering and Public Policy at Carnegie-Mellon University is seeking to add a new faculty member at the level of assistant professor in resource or mineral economics to work in collaboration with engineering-based research programs primarily in materials policy but possibly in hazardous materials, energy systems, and/or environmental systems. There are no reasonable prospects for a joint academic appointment with either the School of Urban and Public Affairs or the Department of Social Science. Send resume with list of publications and statement of research interests to:

Dr. Indra Nar
61222
Department of Engineering and Public Policy
Carnegie-Mellon University
Pittsburgh, PA 15213
CMU is an equal opportunity employer.

Princeton University. A research position is available beginning 1 January 1982 in the Department of Geological and Geophysical Sciences for research on the effects of the atmosphere and oceans on the Earth's climate system. Past experience in Earth rotation problems and spatial geodesy techniques as well as familiarity with meteorological data sets is required. Send resumes to: A. Dahlen, Department of Geological and Geophysical Sciences, Princeton University, Princeton, NJ 08544.

Princeton University is an equal opportunity affirmative action employer.

Faculty Position in Geophysics/Structural Geology/Engineering Geology. The Department of Geological Sciences at Case Western Reserve University in Cleveland, Ohio is seeking candidates to fill an anticipated faculty position in the broadly defined areas of geophysics/structural geology/engineering geology. While field specialization is open, the successful candidate will be charged with conducting the Department's teaching programs in geophysics at the graduate and undergraduate levels, in addition to carrying out a vigorous research program. Ample opportunities exist for research collaboration both within the Department of Geological Sciences and with faculty members in the School of Engineering.

Ph.D. or equivalent is required. Please submit applications, consisting of resume, names of three references and a statement of research and teaching interests to:

Samuel M. Savin
Department of Geological Sciences
Case Western Reserve University
Cleveland, Ohio 44106.

Case Western Reserve University is an equal opportunity affirmative action employer.

Structural Geology/University of Illinois at Champaign-Urbana. (Search reopened) The Geology Department is seeking a structural geologist for a tenure-track (assistant professor) faculty position. A Ph.D. is required. Salary open. The successful candidate will be expected to teach advanced undergraduate and graduate courses in structural geology and establish a research program. For equal consideration, applications, including the names of three references, should be sent by February 1, 1982 to Dr. D. E. Anderson, Department of Geology, University of Illinois, 245 Natural History Building, 1301 West Green Street, Urbana, IL 61801-2998, (217) 333-6713.

Position to be filled by September 19, 1982.

The University of Illinois is an affirmative action equal opportunity employer.

Hydrology/Tenure Track Position at Assistant or Associate Professor Level. Candidate should be a specialist in some quantitative aspect of hydrology with demonstrated skills in formulating hydrologic models, and a background in transport phenomena. Academic or professional credentials at Ph.D. level required. Starting date negotiable but could be as early as August 1982. Resumes, etc., should be received by March 1, 1982. Interested persons should request job description from Dr. E. S. Simpson, Chairman, Search Committee, Department of Hydrology and Water Resources, University of Arizona, Tucson, Arizona 85721.

Equal opportunity affirmative action employer.

Seagoing Research Assistant in Physical Oceanography. Applications invited for position in the School of Oceanography, Oregon State University, U.S. in physics or engineering on a 12-month cruise experience needs some familiarity with computers and electronic instruments. Must be able to assume position by 15 February 1982. Appointment will take responsibility for deployment of a water-structure profiler or a cruise in May-June 1982; will take responsibility for preparation of data, calibrations, work at sea, and preparation of the data report. Salary: \$20,000 or more depending on experience. Submit application and names of three references by 25 December 1981 to: Douglas R. Caldwell, School of Oceanography, Oregon State University, Corvallis, OR 97331.

An affirmative action/equal opportunity employer.

Petrology/Geochemistry/Florida International University. Applications are invited for one tenure track position (assistant professor) available from August 1982. The successful candidate will be expected to teach at the undergraduate level and pursue a vigorous research program. The applicant should have a background in petrology and geochemistry. Highly qualified candidates in the areas of geophysics or hydrogeology may also be considered. Applications should be sent by closing date March 15, 1982. Applications including a curriculum vitae, research interests, and three letters of reference should be sent to:

Dr. Leonard Keller, Chairman, Department of Petrology, Florida International University, P.O. Box 17000, Miami, Florida 33199.

FIU is a member of the State University System of Florida and is an equal opportunity affirmative action employer.

Theoretical Geophysicist/Seismologist. The Department of Geological Sciences at Southern Methodist University is seeking to fill a faculty position to establish programs of research and graduate undergraduate teaching. A position will be filled in one of the following fields:

- (1) Theoretical Geophysicist—possible fields of interest are inverse theory, digital data processing or numerical modeling. Applications to seismology, gravity, magnetism, or electrical methods preferred.
- (2) Seismologist—preferred interests in reflection seismology, possibly in data acquisition and interpretation. Industry experience and/or willingness to interact with local exploration geophysicists is desirable.

These positions are part of a program to expand the existing geophysics group which consists of two senior faculty members, several Ph.D. research associates and technicians. The Mathematical Department has an excellent numerical methods group of four faculty members which encourages research with the applied sciences. Computer facilities are excellent, consisting of CDC Cyber 73 and CDC 6600 main frames with remote access to CRJ, Tektronix graphics and hard copy terminals within the Department. The Department also houses a Nova 4, a PDP 11, several other minicomputers and is in the process of installing a VAX system for geophysical data processing. Several major research groups are based in Dallas. Interaction with these and other local geophysicists is encouraged together with a reasonable amount of consulting. Academic rank and salary are negotiable and considerable flexibility exists in the area.

Send resume and names of three references to: M. J. Holdaway, chairman, Department of Geological Sciences, S.M.U., Dallas, TX 75275.

S.M.U. is an affirmative action/equal opportunity employer.

Yale University/Department of Geology and Geophysics. Applications are solicited for a faculty position in solid earth geophysics to begin in the academic year 1982-83. Areas of interest to the Department include seismology, exploration geophysics, mechanical and physical properties of rocks and minerals, geomagnetism, and tectonophysics.

Yale University is an equal opportunity/affirmative action employer and encourages women and members of minority groups to compete for this position. Curriculum vitae, publications and the names of three or more referees should be sent by 31 December 1981 to Robert B. Gordon, Chairman, Department of Geology and Geophysics, P.O. Box 6668, New Haven, CT 06511.

Physical Oceanographer. Royal Roads Military College expects to have a tenure track vacancy in Department of Physics effective 1 July 1982. Candidates should hold doctorate or near doctorate in physical oceanography preferably with experience in digital hardware and microcomputer applications. Appointment expected to be made at assistant professor level but salary and rank dependent on qualifications and experience. Relocation expenses can be provided. Duties include undergraduate teaching in physics and physical oceanography, and research in marine sciences. Applications should include complete dossier and names of three references and be sent to: Dr. E. S. Graham, Principal, Royal Roads Military College, FMO Victoria, B.C. V8B 1S0.

This competition is open to both men and women. Knowledge of English only is required. Only Canadian citizens or landed immigrants need apply. Tourist Information relative to a concours est disponible en français et peut être obtenue en écrivant à Dr. Graham.

Iowa State University of Science and Technology/Department of Earth Sciences.

Applications are invited for two tenure track faculty positions. The rank for each is at the assistant or associate professor level, dependent upon qualifications. The successful applicants will be expected to develop strong research and graduate student programs. Teaching duties will include undergraduate and graduate courses in the areas of expertise. **Mineral Resources/Economic Geology.** One position is in mineral resources/economic geology. An applied field orientation is preferred. Iowa State has established a Mining and Mineral Resources Research Institute and an Interdepartmental minor in Mineral Resources in order to support and develop research and education in this area. In addition to the appointment in the Department of Earth Sciences there will be full opportunities to interact with these programs.

Geomorphology. The second position is in the general field of geomorphology. Additional expertise in an area related to geomorphology, such as groundwater, engineering geology or remote sensing is also desired. A person with an applied field orientation is being sought.

Each appointment will be on an academic year basis. Opportunities are available for summer teaching appointments. Salaries will be commensurate with qualifications. Application deadlines for both positions are February 15, 1982; later applications will be accepted if a position is not filled. Positions are both currently available and are expected to be filled no later than fall, 1982. For application information please write to:

Bert E. Nordlie
Department of Earth Sciences
283 Science I
Iowa State University
Ames, Iowa 50011

Iowa State University is an equal opportunity/affirmative action employer.

Surficial Geology/Ground Water. Utah State University. Tenure track position starting spring quarter of 1982 or fall quarter of 1982. Ph.D. required. Rank and salary negotiable. Surficial geology with emphasis on geologic field studies and ground water with attention to both geologic and geohydrologic aspects. Emphasis on the arid West. Closing date November 30, 1981. USU is an affirmative action equal opportunity employer. Department of Geology (07), Utah State University, Logan, Utah 84322.

Send resume, statement of future research interests, and names of at least three references to: Larry Haskin, Chairman, Department of Earth and Planetary Sciences, Washington University, St. Louis, MO 63130. Applications received through February 15, 1982.

Washington University is an equal opportunity/affirmative action employer.

POSTDOCTORAL POSITION IN MARINE CHEMISTRY

Woods Hole Oceanographic Institution invites applications for the position of Postdoctoral Investigator. This position is being offered for basic research on the chemistry of the particle flux in the ocean and on the chemistry of sediment-seawater interactions, with particular emphasis on the transport of trace metals and radionuclides. Preference will be given to applicants with training in radiochemistry, trace-element analysis, surface chemistry, or geochemical modeling. Send resume and names of three references to:

Personnel Manager
Box 84-P
Woods Hole, MA 02543
An equal opportunity employer M/F/H

WOODS HOLE OCEANOGRAPHIC INSTITUTION

Woods Hole, MA 02543
An equal opportunity employer M/F/H

Oceanographer.

GS-1360-12, Salary \$28,245-\$26,723. The Remote Sensing Branch of the Naval Ocean Research and Development Activity (NORDA) is seeking qualified applicants for the position of Oceanographer. Duties include: Serving as principal investigator for planning and executing basic and applied scientific investigations of the probing of the ocean surface, and interpreting the results of these investigations in terms of oceanographic parameters. Specific areas of investigation will include the detection and analysis of ocean fronts and eddies through the use of satellite-borne altimeters. Send a current SF-171 no later than 21 December 1981 to the Civilian Personnel Office (Code 140A), Naval Ocean Research and Development Activity, NSTL Station, MS 39529 or call 601-888-4641 for appropriate forms or additional information.

An EEO Employer.
U.S. Citizenship Required.

Planetary Scientist/Washington University. The Department of Earth and Planetary Sciences has available a tenure track or tenured position beginning in the fall of 1982 for a geoscientist with research interests in such areas as planetary geophysics, planetary materials, or planetary atmospheres. Preference will be given to research areas that complement the current departmental program.

The successful candidate must have the following attributes: demonstrated creativity and promise of excellence in research and training; intent to develop a vigorous graduate research program; desire to teach courses in field of interest and related fields of geoscience at undergraduate and graduate levels.

Send resume, statement of future research interests, and names of at least three references to: Larry Haskin, Chairman, Department of Earth and Planetary Sciences, Washington University, St. Louis, MO 63130. Applications received through February 15, 1982.

Washington University is an equal opportunity/affirmative action employer.

Vincent C. Kelley and Leon T. Silver Graduate Fellowships DEPARTMENT OF GEOLOGY THE UNIVERSITY OF NEW MEXICO

The Department of Geology of the University of New Mexico invites applications for the Vincent C. Kelley and Leon T. Silver Graduate Fellowships. The fellowships will be awarded on the basis of the fellowship will provide for a generous living stipend of \$1,000/month for 9 to 12 months, and up to \$2,000/year for travel and research expenses. The awards are made on an annual basis, but may be renewed for up to three years as long as the student maintains excellent academic standing and shows evidence of significant progress in research. Preference will be given to, but is not restricted to, applicants for the Ph.D. program.

An application for admission to the UNM Graduate Program, transcripts, Graduate Record Exam results (verbal, math & geology), three letters of recommendation and a brief statement of research goals are required for consideration for the fellowships. Application materials may be obtained from:

Rodney C. Ewing
Chairman
Department of Geology
University of New Mexico
Albuquerque, New Mexico 87131

The deadline for applications is March 1, 1982 for the Fall semester of 1982.

Lahigh University. Research Associate (Post Doctoral) position involving a study of the geochemistry of meteoritic metallic phases. Solidification experiments are planned with Fe-Ni-S-P-C alloys to determine partition coefficients of geochemically important minor elements—Ir, Ga, Au, etc. Goal is to investigate behavior of particular elements during the solidification of the core and mantle of asteroidal parent bodies.

The position is available after January 1, 1982. Letters of recommendation should be sent to: Dr. Robert S. Lindsley, University in an equal opportunity/affirmative action employer. Send vita and the names of three references to Professor Joseph I. Goldstein, Department of Metallurgy and Materials Engineering, Box 95, Lahigh University, Bethlehem, PA 18015.

Research Associate/Theoretical Physical Oceanography. Applications invited for two postdoctoral research associate positions in the School of Oceanography, Oregon State University. Applicant will conduct research in theoretical modeling and observational comparisons of ocean circulation. Ph.D. in Mathematics or the physical sciences. Submit resume, brief statement of research interests and three references by 1 January 1982 to Prof. Paam P. Miller, School of Oceanography, Oregon State University, Corvallis, Oregon 97331.

An affirmative action/equal opportunity employer.

Structural Geologist or Geophysicist/Washington University. The Department of Earth and Planetary Sciences has available a tenure track or tenured position beginning in the fall of 1982 for a structural geologist or geophysicist. Preference will be given to candidates with research interests in field studies or measurements pertaining to the formation and evolution of continental crust. Interest of the candidate should complement those of present faculty in geochemistry, geophysics, and economic geology of Precambrian regions.

The successful candidate must have the following attributes: demonstrated creativity and promise of excellence in research and training; intent to develop a vigorous graduate research program; desire to teach courses in field of interest and related fields of geoscience at undergraduate and graduate levels.

Send resume, statement of future research interests, and names of at least three references to: Larry Haskin, Chairman, Department of Earth and Planetary Sciences, Washington University, St. Louis, MO 63130. Applications received through February 15, 1982.

Washington University is an equal opportunity/affirmative action employer.

Metamorphic Geologist. The Department of Earth Sciences of Montana State University anticipates a new position in geology and invites applications for a tenure track position at the assistant professor level beginning either June or September, 1982. We seek a field-oriented metamorphic geologist with a background in research and teaching. Degree in geology is desirable. Candidates must have demonstrated teaching introductory geology and undergraduate mineralogy-petrology courses, and will be expected to participate in summer field instruction. Completion of Ph.D. prior to appointment is strongly preferred. Our department has 11 faculty and is multi-disciplinary. B.S. options in geology, geophysics, geological planning, geography, and meteorology and an M.S. option in geology are currently of lead.

Send resume, transcripts, and three letters of recommendation by February 10, 1982 to: Dr. Robert A. Chadwick, Department of Earth Sciences, Montana State University, Bozeman, MT 59717. Montana State University is an affirmative action/equal opportunity employer.

University of Hawaii Faculty Positions. The Department of Geology and Geophysics and the Hawaii Institute of Geophysics of the University of Hawaii are seeking applicants for two tenure track positions becoming available January 1, 1982. Candidates should have specialization in (1) marine geophysics with emphasis in one or more of the following: marine seismology, magnetism and gravity, or (2) marine geology/seismology. One of these positions will be filled at a rank of full professor, the other at assistant or associate level.

Applicants should have demonstrated ability to conduct and promote marine research commensurate with the level of the application. Ability to teach at all levels is expected. The positions will be joint ones on an 11-month basis with the Department and the Institute and will involve both teaching and research responsibilities. Apply with resume, projected level of appointment and the names of 3 referees to Chairman, Personnel Committee, Department of Geology and Geophysics, University of Hawaii, Honolulu, Hawaii 96822.

Closing date for applications is January 1, 1982. The University of Hawaii is an affirmative action/equal opportunity employer.

Petrologist-Economic Mineralogist/University of Oklahoma. Applications are invited for a tenure-track position, effective September 1, 1982 at the assistant professor level, in petrology and economic mineralogy. The successful applicant is expected to teach graduate courses in higher secondary petrology-petrography, and to pursue an active research program. Consulting and interacting with mining companies are encouraged.

The University of Oklahoma has made a major commitment to diversify the program in the School of Geology & Geophysics. As a result five tenure-track positions are open for the fall of 1982. Six additional positions were added to the School in the fall of 1981 (bringing the total full-time faculty to 15), and an additional six positions will be available during 1983-1986. A new building that will house the School is in the design stage, and the successful applicant will participate in equipping it.

The Ph.D. degree is required for this position. Preference will be given to petrologists with a strong background in structural geology and with a demonstrated interest in the economic geology of metallic and non-metallic mineral deposits. Qualified applicants should arrange to send transcripts of all college and university work, resume, statement of research interests, and three letters of reference to: Dr. Maynard Cameron, School of Geology and Geophysics, University of Oklahoma, Norman, Oklahoma 73019. Deadline for applications is September 30, 1981. Faculty members from the School will be interviewing on the November 8-9, 1981 meeting in Cincinnati, Ohio, and at the December 1981 meeting in San Francisco, California.

The University of Oklahoma does not discriminate on the basis of race, or sex, and is an equal opportunity employer.

Marine Coordinator/University of South Florida. Baccalaureate degree in a science, MS and 5 years experience in oceanography or a related field. Must be (1) able to supervise the work of a technician, and (2) able to do budgetary and accounting, and (3) thoroughly familiar with equipment and logistical problems and solutions in marine science. Salary range \$18,000-20,000 per annum. Application deadline is December 31, 1981. Apply with resume and references to:

Chairman
Department of Marine Science
University of South Florida
140 Seventh Avenue South
St. Petersburg, FL 33701.

Physical Oceanographer. The School of Oceanography, Oregon State University is soliciting applications for an assistant or associate professor, depending on experience. Applicants must be observationalists or theoreticians, but must be able to do both. The physical sciences and must be able to conduct independent high-quality research and obtain research funding. Duties include teaching and supervising graduate students. Interested candidates should submit a resume and names of three references by 1 January 1982 to: G. Ross Heath, Dean, School of Oceanography, Oregon State University, Corvallis, Oregon 97331.

Affirmative Action/Equal Opportunity Employer.

Seismologist/University of Utah. Search extended: The University of Utah is expanding its geophysics program in the Department of Geology and Geophysics by adding a tenure track faculty member in seismology at the assistant to associate professor level. Applicants with backgrounds and theoretical seismology should be given preference. The individual will be expected to teach undergraduate and graduate courses, and to pursue an active research program with graduate students. The department has modern teaching and research programs in geology and geophysics, and has close processing groups in computer science, electrical engineering and mathematics. The geophysics component of the department has strong research and teaching programs in seismology, electrical and electromagnetic methods, thermal properties of the earth, and potential fields. Current research in seismology includes: seismological and earthquake studies utilizing a new PDP 11/70 computer with a 55 station telemetered network, utilizing a new on-line PDP 11/34 computer, major experiments in seismic refraction profiling, investigations of seismic propagation from synthetic seismograms, application of inverse theory to seismology, seismic properties of volcanic systems and applications in tectonophysics. The closing date for applications is December 31, 1981. A Ph.D. is required for this position. Applicants should submit a vita, transcripts, a letter describing his/her research and teaching goals, and names of five persons for reference to William P. Nash, Chairman, Department of Geology and Geophysics, University of Utah, Salt Lake City, Utah 84112.

The University of Utah is an equal opportunity affirmative action employer.

Geophysical Fluid Dynamical Physical Oceanographer. Applications are solicited for a junior faculty position in ocean physics or dynamics to begin in the academic year 1982-83. Areas of interest to the Department include analytical, numerical and laboratory modeling of physical processes and phenomena in the ocean.

Yale University is an equal opportunity affirmative action employer and encourages women and members of minority groups to compete for this position. Curriculum vitae, publications, and the names of three or more referees should be sent by 31 December 1981 to Robert B. Gordon, Chairman, Department of Geology and Geophysics, P.O. Box 6668, New Haven, CT 06511.

Research Associate Position University of Arizona. The Lunar and Planetary Laboratory anticipates a postdoctoral position will become available in January 1982. This is a one year, non-renewable position. The position will involve laboratory studies of the infrared spectral reflectances of meteorites, terrestrial samples and rocks. These data will be used for interpretation of high-resolution spectra of asteroids and other planet satellites. Applicants should have experience with IR spectrometers at the telescope and in the laboratory.

Vita, bibliography, and three letters of reference should be sent by December 31, 1981 to:

Dr. Larry A. Lebofsky
Lunar and Planetary Laboratory
University of Arizona
Tucson, AZ 85721
Equal opportunity affirmative action Title IX Section 504 employer.

Faculty Positions. Two Faculty Positions in Geology. Tenure track positions in geology, assistant and professorships. Ph.D. required or equivalent experience. Fall 1982.

Petrologist-Mineralogist. Candidate must be able to teach introductory geology, mineralogy, petrology, geochemistry, and optical mineralogy-petrography.

Invertebrate Paleontologist-Soft-Rock Geologist. Candidate must be able to teach courses in invertebrate paleontology, micropaleontology, sedimenta-

University of Utah Faculty Positions. The Department of Geology and Geophysics invites applications for four tenure track positions at the assistant to associate professor level.

- 1) **Economic Geology.** The specific area of expertise is open, however, preference will be given to candidates whose research interests are in geology, geochemistry, or petrology. Characteristics of metallic mineral deposits.
- 2) **Sedimentary geology.** Applicants should have research interests in modern or ancient sedimentary basins.
- 3) **Seismology.** Applicants with backgrounds and specialties in seismic reflection, seismic imaging or theoretical seismology will be given preference.
- 4) **Potential fields.** Geophysicist with specialty in potential theory including gravity and magnetism. (The closing date for this position is January 31, 1982).

A Ph.D. or equivalent is required. The vacancies are to be filled by September 1982, the closing date for applications for positions 1-3 is December 31, 1981. Applicants should submit a vita, transcripts, a letter describing his/her research teaching goals, and names of five persons for reference to William P. Nash, Chairman, Department of Geology and Geophysics, University of Utah, Salt Lake City, Utah 84112.

The University of Utah is an equal opportunity affirmative action employer.

Princeton University/Water Resources Program, Department of Civil Engineering.

Department of Civil Engineering invites applications for a tenure track, three-year appointment at the assistant professor rank beginning on or before September 1982. Responsibilities include graduate and undergraduate teaching in hydrology and water resources, and participation in research into either hydrological processes associated with infiltration and unsaturated flow or chemical processes and transport in the unsaturated zone. Candidates must have Ph.D. degree with demonstrated teaching ability and scholarship.

Submit resume and references to:
Eric F. Wood, Director
Water Resources Program
Department of Civil Engineering
Princeton University
Princeton, NJ 08544

Princeton University is an affirmative action equal opportunity employer.

Geophysical Fluid Dynamical Physical Oceanographer. Applications are solicited for a junior faculty position in ocean physics or dynamics to begin in the academic year 1982-83. Areas of interest to the Department include analytical, numerical and laboratory modeling of physical processes and phenomena in the ocean.

Yale University is an equal opportunity affirmative action employer and encourages women and members of minority groups to compete for this position. Curriculum vitae, publications, and the names of three or more referees should be sent by 31 December 1981 to Robert B. Gordon, Chairman, Department of Geology and Geophysics, P.O. Box 6668, New Haven, CT 06511.

Research Associate Position University of Arizona. The Lunar and Planetary Laboratory anticipates a postdoctoral position will become available in January 1982. This is a one year, non-renewable position. The position will involve laboratory studies of the infrared spectral reflectances of meteorites, terrestrial samples and rocks. These data will be used for interpretation of high-resolution spectra of asteroids and other planet satellites.

Applicants should have experience with IR spectrometers at the telescope and in the laboratory. Vita, bibliography, and three letters of reference should be sent by December 31, 1981 to:

Dr. Larry A. Lebofsky
Lunar and Planetary Laboratory
University of Arizona
Tucson, AZ 85721
Equal opportunity affirmative action Title IX Section 504 employer.

Faculty Positions. Two Faculty Positions in Geology. Tenure track positions in geology, assistant and professorships. Ph.D. required or equivalent experience. Fall 1982.

Petrologist-Mineralogist. Candidate must be able to teach introductory geology, mineralogy, petrology, geochemistry, and optical mineralogy-petrography.

Invertebrate Paleontologist-Soft-Rock Geologist. Candidate must be able to teach courses in invertebrate paleontology, micropaleontology, sedimenta-

tion, and historical geology. Additional expertise in recent marine environments highly desirable.

Applicants are expected to do research in their areas of expertise, and to teach students. Field trips, strong teaching and research commitments expected. Submit applications with resume and copies of transcripts, and three letters of recommendation to the Chairperson, Department of Earth & Space Sciences, Indiana University-Purdue University at Fort Wayne, Fort Wayne, Indiana 46805. Indiana University-Purdue University is an equal opportunity/affirmative action employer.

STUDENT OPPORTUNITIES

Earth and Planetary Sciences, Massachusetts Institute of Technology. Our Department has research and teaching assistantships available for new graduate students enrolling in September 1982. Research opportunities encompass a wide range of topics in planetary sciences, geophysics, geology, geochemistry, and pet

AGU

John F. Dewey—Tectonics Editor

"I want the journal to acquire a reputation for very rapid, fair, and accurate reviewing," asserted John F. Dewey, editor-in-chief of AGU's newest journal, *Tectonics*. Dewey said that he will rule the bimonthly, which will begin publication in February, "with a bit of a rod of iron" to ensure that *Tectonics* is "where only original and important papers are published."

"I'm going to be very strict with reviewers," Dewey explained in his quick British clip. "If the review does not come back to me within 10 days to 2 weeks, I'll review the paper myself. I'm also going to have a system whereby, if a paper needs major surgery after being refereed, it will be rejected. Papers will have to be in virtually publishable condition before they are first submitted," he said.

A rapid reviewing process and a demand for high-quality papers will distinguish *Tectonics* from other journals that touch on the field, Dewey said. The new journal also will carve out its niche by being heavily weighted toward the geological aspects of plate tectonics. "There's no other journal that emphasizes that aspect," he noted. He also pointed out that *Tectonics* will not detract from the red section of the *Journal of Geophysical Research*. While JGR-Red concentrates on the geophysics of tectonics and marine plates, Dewey wants to emphasize continental tectonics.

Concerned with high standards, Dewey talks about the birth and growth of *Tectonics*: "I'll be very happy once the journal has, say, two years of fine issues under its belt. It takes six months or a year or even two years to accelerate to get a line journal going."

February's issue will include six or seven papers, but Dewey said he aims for high quality, not quantity, of papers. "I don't care if we only publish four or five papers an issue, provided those papers are truly first rate."

Aiding Dewey will be Paul Tappanier as European editor and B. Clark Burchfiel as North American editor. A board of associate editors will assist them.

Dewey, a native of London, received Ph.D. and D.I.C. degrees in 1960 from Imperial College, University of London. He lectured on structural geology at the universities of Manchester and Cambridge from 1960 to 1970, and then he joined the State University of New York at Albany.



John F. Dewey

In 1967 he came to North America on sabbatical as a visiting research associate at the Lamont-Doherty Geological Observatory. "It was just luck that I happened to be on sabbatical at the right place at the right time," Dewey said. It was then that some of the scientists—such as Xavier Le Pichon, Walter Pitman, and Lynn Sykes—vital to the development of plate tectonics were at Lamont working on the theory. "I learned a massive amount from these people, including a whole new methodology for the science of geology. In a period of about three months," Dewey reflected, "my attitude towards geology was transformed," to viewing it in terms of plate tectonics.

In 1980 he was promoted to distinguished professor at Albany. This Christmas he will step down from that post to become professor of geology at the University of Durham in England and research professor at Albany. He will continue to pursue his current research, which includes study of the neotectonic evolution of Anatolia; the structural history of the Err, Eile, and Silvretta nappes in eastern Switzerland; stratigraphic and thermal evolution of rift basins and hydrocarbon maturation; and the tectonics of overthrust belts and the evolution of foreland basins. Dewey also plans to write a graduate textbook on the principles of plate tectonics.

"What I would like to look back on in 20 years when I retire," Dewey said, "is to see a row of *Tectonics* issues that essentially would form a handbook that would be the first place people would look for the critical data on and syntheses of the regional tectonics of the world."—BTR

Meetings

Physics and Chemistry of Ice

The Sixth International Symposium on the Physics and Chemistry of Ice will be held on the Rolla Campus of the University of Missouri on August 2-6, 1982. The symposium, to be convened for the first time in the United States, will cover fundamental studies of ice phases, experimental and theoretical work, and investigations that depend in part on the properties of ice (including meteorology, atmospheric electricity, glaciology, planetary modeling, engineering problems caused by climate ice, and the biological effects of ice formation).

Other topics to be covered include diffusion and relaxation phenomena, lattice dynamics, electrical and mechanical properties, ice evolution, extraterrestrial ice, surface structure and properties, ice chemistry, and geological evolution as revealed by ice samples.

Abstracts must be written in English and include authors' names, paper title, and a two- or three-sentence summary; deadline is January 15. Extended abstracts and registration forms are due May 1. Registration fees are \$75 for professionals and \$25 for students. A \$25 late fee will be charged for registration received after May 1. Questions on the technical program should be addressed to the conference chairman, Patricia L. M. Plummer, Graduate Center for Cloud Physics Research, 109 Norwood Hall, University of Missouri, Rolla, MO 65401 (telephone: 314-341-4340). Information about the social program, registration, and housing can be obtained by writing to the coordinator, Martha Fort, 105AH/SS, University of Missouri, Rolla, MO 65401.

The conference is sponsored by the American Physical Society, the American Chemical Society, the American Meteorological Society, and the International Commission on Snow and Ice of the International Union of Geologists and Geophysicists.

National Aerospace Meeting of The Institute of Navigation

by Patrick Fell

The program for this year's aerospace meeting of The Institute of Navigation addressed developments in the evolving Global Positioning System (GPS) of navigation satellites, inertial navigation systems, and other electronic navigation systems and their applications. Also included in the program were a limited number of papers addressing the geodetic use of the GPS system.

The Global Positioning System is a constellation of 18 navigation satellites being developed by the Department of Defense to provide instantaneous worldwide navigation. The system will support a multitude of military applications. The first paper by Jacobson reviewed the engineering development of GPS navigation receivers stressing the use of common hardware and software modules. A later paper by Ould described the mechanization of a digital receiver for GPS applications designed for faster acquisition of the spread spectrum satellite transmissions than analog receivers. The paper by Brady discussed the worldwide coverage that is provided by the limited number of satellites that will constitute the GPS constellation through 1983. The capability provided by the satellites presently on orbit would support a variety of experiments at almost any location. Tables of multiple satellite availability are provided for numerous worldwide locations. For civil aviation applications, Vogel addressed the satellite geometry considerations for low cost GPS user equipment. Esposito described the Federal Aviation Administration acceptance tests of a GPS navigation receiver, and Hopkins discussed the design and capability of an integrated GPS strapdown attitude and heading reference system for avionics.

Geodetic applications of the GPS system to mapping, charting, and geodesy were summarized by Senus, who described two programs under development by the Defense Mapping Agency. These include the first GPS receiver for space application aboard a future NASA LANDSAT mission and the testing and development of geodetic receivers for terrestrial surveying operations. This latter program is jointly sponsored by DMA, NASA, USGS, and NOAA/NGS. The paper presented by Evans described the accuracy obtainable for estimating changes in geodetic receiver antenna positions using GPS Doppler techniques.

A second major area of discussion was inertial navigation systems and related topics. A paper by Giardina presents a comparative study of algorithms used in strapdown navigation systems. Hung discussed the effect of acceleration errors caused by vehicle rotations when strapdown navigation systems are not located at the center of rotation. Bachman presented flight test results for the ring laser gyro navigator, and DiPasquo discussed the design definition for an advanced aircraft inertial sensor system. Other papers dealing with hybrid strapdown systems, navigation systems planning, memory requirements for aerospace navigation systems, and aircraft velocity sensing were presented.

Another collection of papers dealt with other electronic navigation systems. One such system, the Joint Tactical Information Distribution System (JTIDS), is a defense communications system providing the means for obtaining accurate range measurements to support relative navigation. Papers by Weiss and Rome described navigational aspects of this system. A paper by Gupta discussed Omega signal selection, and Rome discussed error and decision analysis for the BCAS aircraft collision avoidance system. Garza-Robles presented a paper on an autonomous Doppler position

Scholarship Assistance for Minority Students in Earth, Space, and Marine Science For 1982-1983

The American Geophysical Union is once again pleased to participate in the American Geological Institute's Minority Scholarship Assistance Program

Eligible Candidates are:

- Graduate or undergraduate students with good academic records
- Enrolled in, or applying to, an accredited institution to study earth, space, or marine science
- Black, American Indian, or Hispanic students who are U.S. citizens

For a flyer for your student, call or write to:

Member Programs • American Geophysical Union • 2000 Florida Ave., N.W. • Washington, D.C. • 20009 • 462-6903 or 800-424-2488 outside the Washington, D.C. area

For applications, write to:

William H. Mathews III, Director of Education • American Geological Institute • Box 10031, Lamar University Station • Beaumont, Texas • 77710

Application Deadline, February 1, 1982

AGU CHAPMAN CONFERENCE

RAINFALL RATES

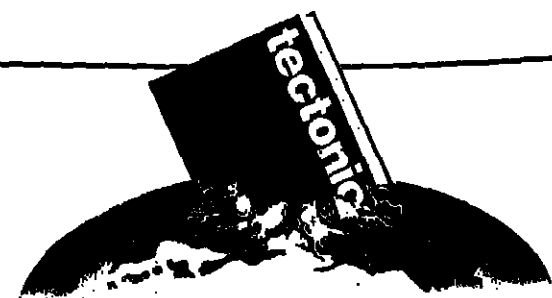
April 27-29, 1982 Urbana, Illinois

Convenor: D. M. Hershfield

Sessions planned:

Atmospheric physics as related to rainfall processes. Measurement: mass (tipping bucket), photoelectric, magnetic, and remote methods. Models: physical, mathematical, and statistical. Applications: point, area, quasi-horizontal path, surface, troposphere, and stratosphere.

Call for papers published in EOS, July 14. Abstract deadline: December 21, 1981.



tectonics

John F. Dewey, editor-in-chief
Paul Tappanier, european editor
B. Clark Burchfiel, north american editor

tectonics will keep you abreast of:
• Recent advances in experimental techniques

- The development of new theories
- Successful solutions to problems in crustal evolution through current global tectonics

Students \$10 AGU EGS \$20

Volume 1 February 1982
bimonthly thereafter

ORDER NOW!
American Geophysical Union
2000 Florida Ave., N.W.
Washington, D.C. 20009

800-424-2488 outside the Washington, D.C. area

tioning system using the NIMBUS-6 satellite, which locates moored or free-floating buoys and weather balloons from a single satellite pass.

The meeting was informative for the participants, primarily addressing navigation, but offered some useful information to some in the AGU community. A volume of the proceedings is available from The Institute of Navigation, Suite 832, 815 15th Street, N.W., Washington, D.C. 20005.

This meeting report was prepared and submitted by Patrick Fell of the Space and Ocean Geodesy Branch, Space and Surface Systems Division, Naval Surface Weapons Center, Dahlgren, Va.

Ocean Sciences: AGU/ASLO Joint Meeting



A joint meeting of the American Geophysical Union's Oceanography Section and the American Society of Limnology and Oceanography will be held February 16-19, 1982, in San Antonio, Texas

Registration. Everyone who attends the meeting must register. Preregistration (received by January 29) saves you time and money, and the fee will be refunded if AGU receives written notice of inability to attend by February 8.

Registration rates are as follows:

	Preregistration	At Meeting (after 1/29)
Member	\$55	\$70
Student Member	\$25	\$40
Nonmember	\$75	\$90
Student nonmember	\$32	\$47

Registration for 1 day only is available at half the above rates. Members of American Geophysical Union, American Society of Limnology and Oceanography, Marine Technology Society, and American Meteorological Society may register at the member rates.

The difference between member (or student member) registration and nonmember registration may be applied to AGU dues if a completed membership application is received at AGU by May 19, 1982. Current AGU annual membership rates are: \$20 members; \$7 student members.

To preregister, fill out the registration form, and return it with your payment to the AGU Office. Your receipt will be included with your preregistration material at the meeting. Preregistrants should pick up their registration material at the preregistration desk at the El Tropicano Hotel, headquarters for the meeting. Complimentary badges for guests not attending the scientific sessions will be available at the registration desk.

Hotel Accommodations. Blocks of rooms are being held at the El Tropicano, the St. Anthony, and the Gunter hotels. Read the housing application and MAIL THE COMPLETED APPLICATION FORM TO THE HOUSING DEPARTMENT, San Antonio Convention and Visitors Bureau, P.O. Box 2277, San Antonio, Texas, 78298. MAIL EARLY to insure confirmation at your preferred hotel. DEADLINE FOR RESERVATIONS IS JANUARY 15, 1982. Please do not write or call the AGU office for room reservations.

Social Events. Complimentary refreshments will be served daily from 9:30 to 10:30 A.M., from 2:30 to 3:30 P.M., and again at the Ice Breaker immediately following the session on Tuesday evening.

A luncheon is planned for Wednesday in the Southwest Craft Center, one of the Southwest's finest examples of French architecture of the late 1800's. Fred Spillhaus, Executive Director of AGU will speak on Society Collaboration—Strength for Ocean Sciences. Reserve early as space is limited. Cost—\$8.75 per ticket.

Program Summary

All of the sessions will be held in the El Tropicano Hotel.

Tuesday Particle Fluxes I (AM)

Thursday Anthropogenic Inputs (AM)

Biological and Physical (AM) Feeding Dynamics (AM)

Ocean-River Interaction (AM) Particle Fluxes III (AM)

Large-Lake Processes (AM) Coastal Processes I (AM)

Rings (AM) Climate and Productivity (AM)

Particle Fluxes II (PM) Anthropogenic Inputs (PM)

Biological and Physical (PM) Gulf of Mexico Biology and Circulation (PM)

Ocean-River Interaction (PM) Particle Fluxes IV (PM)

Large-Lake Processes (PM) Coastal Processes II (PM)

Rings (PM) Microscale Processes (PM)

Marine Optics (PM) Friday

Large Oceanographic Program (AM) Microbial Dynamics (AM)

Biogeochemical Cycling (AM) PROBES (AM)

SANDS (AM) Measurement Techniques (AM)

Small-Lake Limnology (AM) Coastal Processes III (AM)

Mesoscale Processes (AM) Bioturbation (AM)

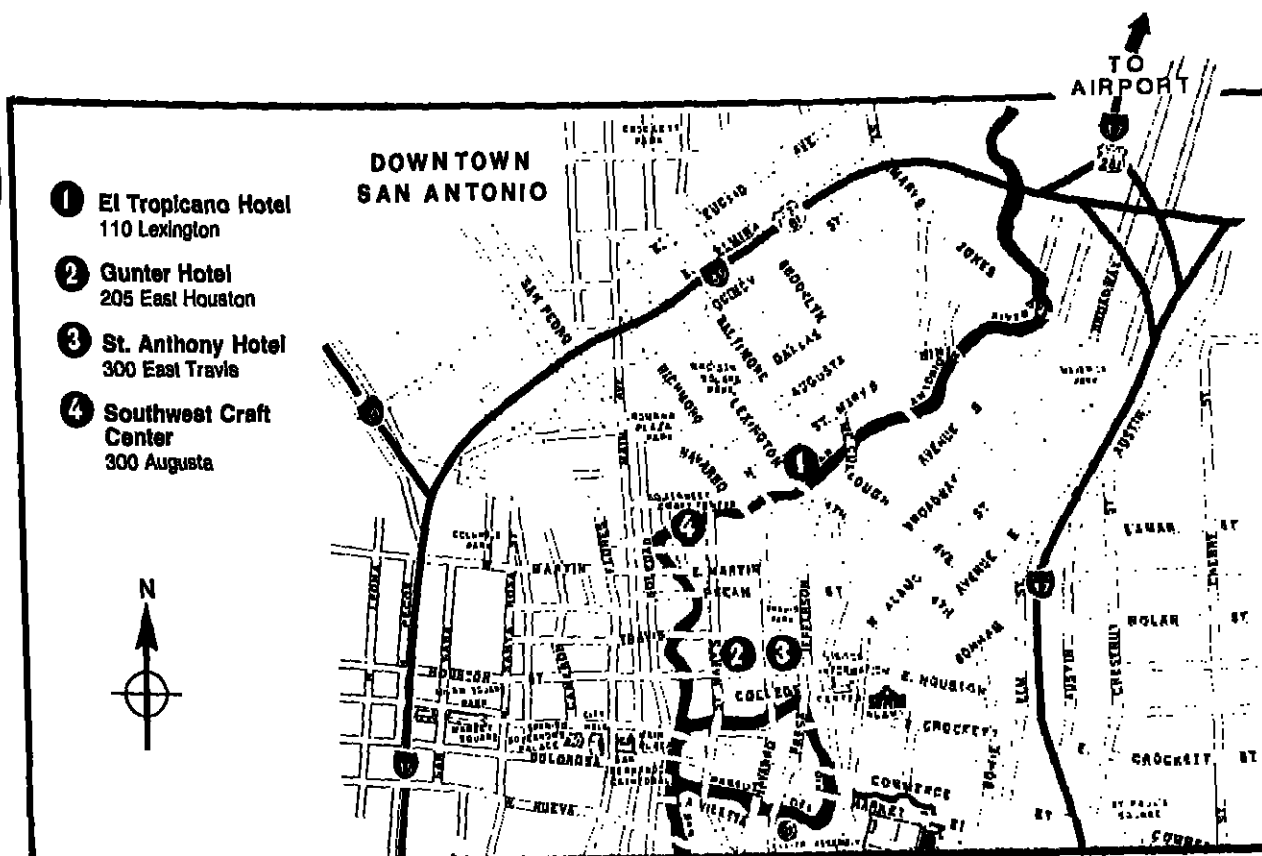
Large Oceanographic Programs (PM) Microbial Dynamics (PM)

Biogeochemical Cycling (PM) General Oceanography (PM)

Geology and Circulation (PM) Measurement Techniques (PM)

Small-Lake Limnology (PM) Trace Metals (PM)

Mesoscale Processes (PM) Bioturbation (PM)



Ocean Sciences: AGU/ASLO Joint Meeting

February 16-19, 1982
San Antonio, Texas

IMPORTANT INSTRUCTIONS

The San Antonio Convention and Visitors Bureau will make hotel assignments upon receipt of the official housing application, provided that it is properly filled out and all necessary information is given. All rooms will be assigned on a first come, first serve basis. All requests must be on this form. Telephone requests are not accepted. OFFICIAL HOTEL CONFIRMATION WILL ADVISE DEPOSIT POLICY. DO NOT SEND MONEY WITH THIS FORM.

Ocean Science Meeting
American Geophysical Union
Housing Department
San Antonio Convention and Visitors Bureau
P.O. Box 2277
San Antonio, Texas 78298

Cutoff date for reservations is
January 15, 1982



HOTEL-MOTEL PREFERENCE: Indicate by number (1) (2) (3) (4). Failure to list maximum number of choices will result in delay as form will be returned for additional selections.

El Tropicano Hotel _____ St. Anthony Hotel _____ Gunter Hotel _____ Annual date _____
Single \$37 _____ Single \$44 _____ Single \$41 _____ Time _____
Double \$47 _____ Double \$60 _____ Double \$61 _____
3 to a room \$55 _____ Double double \$80 _____ 3 to a room \$74 _____
4 to a room \$63 _____ King \$78 _____ 4 to a room \$91 _____
3 to a room \$80 _____

TYPE OF ACCOMMODATIONS DESIRED

- Single(s) (1 person, 1 bed)
- Double(s) (2 persons, 1 bed)
- Twins(s) (2 persons, 2 beds)
- Multiple(s) (3 persons)
- Multiple(s) (4 persons)
- Suite (1 bedroom; parlor)
- Suite (2 bedrooms; parlor)

List below the names of persons occupying each room
(INDICATE THOSE SHARING ACCOMMODATIONS)

NAME _____ TYPE OF ROOM _____

MAIL CONFIRMATION TO: (Please list only one person to receive acknowledgement. If this request is being sent in for a group of people, be sure others do not duplicate.)

PRINT OR TYPE Name _____ Address _____
City _____ State _____ Zip _____
Telephone No.: A.C. () _____

RETURN THIS FORM WITH PAYMENT TO:

Meetings Registration
American Geophysical Union
2000 Florida Ave., N.W.
Washington, D.C. 20009

PLEASE PRINT CLEARLY

NAME ON BADGE _____

AFFILIATION _____

MAILING ADDRESS _____

Telephone # _____

Address during the meeting if different than above _____

The program and meeting abstracts will appear in the January 19 issue of EOS, which is mailed to all members of AGU/ASLO in advance of the meeting.

Ocean Sciences: AGU/ASLO Joint Meeting

February 16-19, 1982
San Antonio, Texas

REGISTRATION FORM

Days you plan to attend
☐ Tuesday ☐ Wednesday
☐ Thursday ☐ Friday

Please check appropriate box
Members of sponsoring societies may register at the member rates

☐ Member AGU
☐ Member ASLO
☐ Member sponsoring society
AMS—American Meteorological Society
MTS—Marine Technology Society
☐ Nonmember

Nonmembers
The difference between member (or student member) registration and nonmember registration may be applied to AGU dues if a completed membership application is received at AGU by May 19, 1982. Current AGU annual membership rates are: \$20 Members; \$7 Student Members.

Preregistrants
Your receipt will be in your preregistration packet. The registration fee will be refunded if written notice of inability to attend is received in the AGU office by February 8.

Office Use Reference Number

Code

Check No.

DEADLINE FOR RECEIPT OF PREREGISTRATION January 29, 1982

(rates applicable only if received by January 29 with payment)

MEMBER ☐ \$55 ☐ \$27.50
STUDENT MEMBER ☐ \$25 ☐ \$12.50
NONMEMBER ☐ \$75 ☐ \$37.50
STUDENT NONMEMBER ☐ \$32 ☐ \$16.00

ABSTRACTS (January 19, 1982, EOS) \$5
LUNCHEON WEDNESDAY, FEBRUARY 16 \$8.75

Charge to ☐ VISA ☐ MasterCard

Card Number _____

Expiration Date _____

Signature _____

Other payments (Please identify) \$ _____

Total enclosed \$ _____

(All orders must be accompanied by payment or credit card information. Make check payable to AGU.)

Office Use

Code

Check No.